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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/780,899	SON ET AL.	
	Examiner	Art Unit	
	Dorothy Sarah Siedler	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6-10-05*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-15, 20 and 21 define a non-statutory process because they merely manipulate an abstract idea, i.e. a mathematical algorithm, without any specific limitation to a practical application. Claims 1-21, reviewed in light of the specification, merely recite a series of steps to be performed on a computer for quantization of LSF coefficients in a speech coding system; this is mathematical in nature.

Therefore claims 1-15, 20 and 21 are directed to an abstract idea, and as such are non-statutory.

Claim 17 recites, “the recording medium of claim 16, wherein the medium is one of a magnetic storage medium, an optical readable medium, and a carrier wave", however this is non-statutory. A carrier wave is a simply a signal, and as such non-statutory.

Claims 16-19 disclose "a computer readable recording medium", however this medium, as disclosed in the specification (page 19), includes a carrier wave. A carrier wave is simply a signal, and thus non-statutory, thus rendering claims 16-19 non-statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by ***Nikneshan*** ("Soft Decision Decoding of a Fixed-rate Entropy-coded Trellis Quantizer over a noisy Channel" University of Waterloo, Technical Report, 2001).

As per claim 1, ***Nikneshan*** discloses a block-constrained (BC)-Trellis coded quantization (TCQ) method comprising:

constraining a number of initial states of Trellis paths available for selection, in a Trellis structure having a total of N ($N=2^v$, here v denotes the number of binary state variables in an encoder finite state machine) states, within 2^k ($0 \le k \le v$) of the total N states, and constraining the number of N states of a last stage within 2^{v-k} among the total of N states dependent on the initial states of Trellis paths (page 9-10, section 3, *a tail biting structure is used where the start and end state on the trellis paths are constrained to the same state)*;

after referring to the initial states of N survivor paths determined under the initial state constraint from a first stage to a stage L-$\log_2 N$ (here, L denotes the number of the entire stages and N denotes the number of entire Trellis states), considering Trellis paths in which an allowed state of the last stage is selected among 2^{v-k} states determined by each initial state under the constraint on the state of a last stage by the constraining in remaining v stages (page 9-10, section 3, *a tail biting structure is used where the start and end state on the trellis paths are constrained to the same state)*; and

obtaining an optimum Trellis path among the considered Trellis paths and transmitting the optimum Trellis path (Abstract and page 9-10, *the optimum path is determined, and transmitted over a noisy channel*).

As per claim 16, this claim recites limitations similar to those recited in claim 2, and is therefore rejected for similar reasons.

As per claim 17, ***Nikneshan*** discloses the recording medium of claim 16, wherein the medium is one of a magnetic storage medium, an optical readable medium and a carrier wave (section 3 and 4, *the system is run on a computer, therefore it must be run on either a magnetic storage medium or and optical readable medium*).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-15 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Eriksson*** ("Interframe LSF Quantization for Noisy Channels" IEEE 1999) in view of ***Erzin*** ("Interframe Differential Vector Coding of Line Spectrum Frequencies" IEEE 1993) and further in view of ***Nikneshan*** ("Soft decision Decoding of a Fixed-rate Entropy-coded Trellis Quantizer over a Noisy Channel" 2001).

As per claim 2, ***Eriksson*** discloses a line spectral frequency (LSF) coefficient quantization method in a speech coding system comprising:

generating a first prediction error vector by performing inter-frame prediction for the LSF coefficient vector, in which the DC component is removed (page 501-505, *a safety net VQ is used with a memory-based VQ (first prediction)*, quantizing the first prediction error vector and generating a quantized first LSF coefficient vector (page 501-505, vector quantization);

generating a second error vector for the LSF coefficient vector, in which the DC component is removed, (page 501-505, *a safety net VQ is use, including a memory-less*

VQ (second prediction) quantizing the second error vector and generating a quantized second LSF coefficient vector (page 501-505, vector *quantization*).

Eriksson does not disclose removing a direct current (DC) component in an input LSF coefficient vector. However, removing the DC component of a signal is a common technique used to simplify data processing by removing information from the signal, such as DC noise.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to remove the DC component of a signal in ***Eriksson***, since it would reduce the complexity of the system and help prevent quantization noise.

Eriksson also does not explicitly disclose generating a first prediction error vector by performing inter-frame *and* intra-frame prediction for the LSF coefficient vector, and generating a second prediction error vector by performing intra-frame prediction. However, ***Eriksson*** does discloses a system with a memory based inter-frame predictor and a memory-less predictor structure, which helps to encode outliers, or low-correlation frames (page 501, section IV). In addition, systems that use both inter-frame and intra-frame predictions are known since high coding efficiency is achieved only when inter-frame and intra-frame redundancy is removed. In the same field of endeavor, ***Erzin*** discloses a system for inter-frame differential coding, where LSFs for the current frame are predicted from LSFs of the previous frame and some from the current frame (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use inter-frame and intra-frame prediction for the first prediction and use intra-frame prediction for the second prediction in ***Eriksson***, since it would enable the system to take advantage of both inter-frame and intra-frame redundancy and improving coding efficiency, while simultaneously improving the encoding of outliners, thus minimizing the number of high distortion frames, as indicted in ***Eriksson*** (page 501, section IV).

Eriksson also does not disclose quantizing the first prediction error vector and the second prediction error vector using BC-TCQ algorithm. However, ***Eriksson*** does disclose that a number of memory-based quantization schemes can be used for LSF parameter quantization, predictive schemes being the most popular (page 495, last paragraph). Additionally, in the same field of endeavor, ***Nikneshan*** discloses the use of a BC-TCQ algorithm for quantizing LSF parameters (page 9-10, section 3, *a tail biting structure is used in a trellis coded quantization scheme, where the start and end state of the trellis paths are the same).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the BC-TCQ algorithm to encode prediction errors in ***Eriksson***, since it avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

Eriksson also does not disclose generating a first LSF coefficient vector by performing inter-frame prediction compensation and generating a second LSF coefficient by performing intra-frame prediction compensation. However, in any predictive vector quantizer the prediction value is added to the quantized prediction error (***Eriksson*** page 496, Figure 1, encoder).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to generate a first and second LSF coefficient by performing inter-frame and intra-frame prediction, respectively, in ***Eriksson***, since one of ordinary skill has good reason to pursue the options within his or her technical grasp in order to obtain the predictable result of an efficient and robust encoder.

Eriksson also does not disclose selectively outputting a vector having a shorter Euclidian distance to the input LSF coefficient vector between the generated quantized first and second LSF coefficient vectors. Instead, ***Eriksson*** selectively outputs a vector having a shorter weighted Euclidian distance to the input LSF coefficient vector between the generated quantized first and second LSF coefficient vectors (page 501, last paragraph). Additionally, ***Eriksson*** notes that the Euclidian distance is a common distortion measure, and one of many distortion measures used during coding (page 501, second column, last paragraph and page 506, first column, second paragraph).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the Euclidian distance measure for the weighted Euclidian

distance measure in ***Eriksson*** to obtain the predictable results of simplifying calculations (page 506, first column, second paragraph).

As per claim 3, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the LSF coefficient quantization method of claim 2, however neither ***Eriksson***, ***Erzin*** nor ***Nikneshan*** disclose obtaining a finally quantized LSF coefficient vector by adding the DC component of the LSF coefficient vector to the quantized LSF coefficient vector selectively output. However, the DC component of a signal may contain important information, such as speech information or a watermark, that is be lost when that component is removed to simplify the coding process.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to add the DC component back to the LSF coefficient vector in ***Eriksson***, since one of ordinary skill in the art has good reason to pursue the options within his or her technical grasp in order to achieve the predictable result of retaining any signal information needed for further processing or verification.

As per claims 4 and 5, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the LSF coefficient quantization method of claim 2, however neither ***Eriksson***, ***Erzin*** nor ***Nikneshan*** disclose wherein in the generating of the quantized first LSF coefficient vector, the inter-frame prediction is performed by moving average (MA) filtering and the intra-frame prediction is performed by auto-regressive (AR) filtering and wherein in the

generating of the quantized second LSF coefficient vector, the intra-frame prediction is performed by AR filtering. However, ***Eriksson*** does disclose that for predictive coding either an MA or AR filter can be used, each with specific advantages and disadvantages (page 497, column 2 first paragraph).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to generate the quantized first LSF coefficient vector by inter-frame prediction using moving average (MA) filtering and intra-frame prediction using auto-regressive (AR) filtering, and generate the quantized second LSF coefficient vector by intra-frame prediction using AR filtering in ***Eriksson***, since one of ordinary skill in the art has good reason to pursue the options within his or her technical grasp in order to achieve the predictable result of optimizing encoding efficiency while minimizing bit error propagation.

As per claim 6, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the LSF coefficient quantization method of claim 2, and ***Nikneshan*** further discloses wherein in a Trellis structure having a total of N ($N=2^v$, here v denotes the number of binary state variables in an encoder finite state machine) states, the BC-TCQ algorithm constrains a number of initial states of Trellis paths available for selection, within 2_k ($0 \le k \le v$) of the total of N states, and constrains a number of states of a last stage within 2^{v-k} among the total of N states dependent on the initial states of Trellis paths (page 9-10, section 3, *a*

tail biting structure is used where the start and end state on the trellis paths are the same).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the structured disclosed in ***Nikneshan*** in ***Eriksson***, since it avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

As per claim 7, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the LSF coefficient quantization method of claim 6, and ***Nikneshan*** further discloses wherein the BC-TCQ algorithm refers to the initial states of N survivor paths determined under the initial state constraint by the constraining from a first stage to a stage L-$\log_2 N$ (here, L denotes the number of the entire stages and N denotes the number of entire Trellis states),and then, in the remaining v stages, considers Trellis paths in which an allowed state of the last stage is selected among 2^{v-k} states determined by each initial state under the constraint on the state of a last stage, obtains an optimum Trellis path among the considered Trellis paths, and transmits the optimum Trellis path(Abstract and page 9-10, section 3, *a tail biting structure is used where the start and end state on the trellis paths are the same).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the structured disclosed in ***Nikneshan*** in ***Eriksson***, since it

avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

As per claim 8, this claim recites limitations similar to those recited in claim 2, and is therefore rejected for similar reasons.

As per claim 9, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the apparatus of claim 8, and ***Eriksson*** further discloses wherein a memory-based trellis coded quantization unit comprises:

a first predictor generating a first prediction value obtained from a sum of quantized and prediction-compensated prediction error vectors of previous frames (page 501, section IV and Figure 1 encoder, *a safety net VQ is used with a memory-based VQ (first prediction)*);

a second subtracter obtaining the prediction error vector of a current frame by subtracting the first prediction value provided by the first predictor from the LSF coefficient vector, in which the DC component is removed (page 501, section IV and Figure 1 encoder, *a safety net VQ is used with a memory-based VQ (first prediction)*;

Eriksson does not explicitly disclose wherein the first predictor is a MA filter. However, ***Eriksson*** does disclose that for predictive coding either an MA or AR filter

can be used, each with specific advantages and disadvantages (page 497, column 2 first paragraph).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to generate a first predictor value by MA filtering in ***Eriksson***, since one of ordinary skill in the art has good reason to pursue the options within his or her technical grasp in order to achieve the predictable result of optimizing encoding efficiency while minimizing bit error propagation.

Eriksson also does not disclose a second predictor generating a second prediction value by AR filtering obtained from multiplication of the prediction factor of i-th element value by (i-1)-th element value quantized by the BC-TCQ algorithm and then intra-frame prediction compensated and a third subtracter obtaining the prediction error vector of i-th element value by subtracting the second prediction value provided by the second predictor from i-th element value of the prediction error vector of the current frame provided by the second subtracter. However, systems that use both inter-frame and intra-frame predictions are known since high coding efficiency is achieved only when inter-frame and intra-frame redundancy is removed. In the same field of endeavor, ***Erzin*** discloses a system for inter-frame differential coding, where LSFs for the current frame are predicted from LSFs of the previous frame and some from the current frame (Abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute a first (inter-frame) and second (intra-frame) prediction

method for the prediction method used in ***Eriksson***, since it would enable the system to take advantage of both inter-frame and intra-frame redundancy, thus improving coding efficiency.

Eriksson also does not disclose a first BC-TCQ obtaining the quantized prediction error vector of i-th element value by quantizing the prediction error vector of i-th element value provided by the third subtracter according to the BC-TCQ algorithm. However, ***Eriksson*** does disclose that a number of memory-based quantization schemes can be used for LSF parameter quantization, predictive schemes being the most popular (page 495, last paragraph). Additionally, in the same field of endeavor, ***Nikneshan*** discloses the use of a BC-TCQ algorithm for quantizing LSF parameters (page 9-10, section 3, *a tail biting structure is used in a trellis coded quantization scheme, where the start and end state of the trellis paths are the same).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the BC-TCQ algorithm for the quantization algorithm in ***Eriksson***, since it avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

Eriksson also does not disclose a first prediction compensation unit performing inter-frame prediction compensation by adding the second prediction value of the second predictor to the quantized prediction error vector of i-th element value provided by the first BC-TCQ and adding the first prediction value of the first predictor to the

addition result. However, as noted previously, systems that use both inter-frame and intra-frame predictions are known since high coding efficiency is achieved only when inter-frame and intra-frame redundancy is removed. In addition, in any predictive vector quantizer the prediction value is added to the quantized prediction error (***Eriksson*** page 496, Figure 1, encoder).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to perform intra-frame compensation by adding the second prediction value of the second predictor to the quantized prediction error vector of i-th element value provided by the first BC-TCQ and adding the first prediction value of the first predictor to the addition result in ***Eriksson***, since one of ordinary skill has good reason to pursue the options within his or her technical grasp in order to obtain the predictable result of an efficient and robust encoder.

As per claim 10, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the LSF coefficient quantization apparatus of claim 8, however ***Eriksson*** does not disclose wherein the non-memory Trellis coded quantization unit comprises a third predictor generating a third prediction value by AR filtering obtained from multiplication of the prediction factor of i-th element value by the intra-frame prediction error vector of (i-1)-th element value quantized by the BC-TCQ algorithm and then intra-frame prediction compensated. However, ***Eriksson*** does disclose a system with a memory based inter-frame predictor and a memory-less predictor structure, which helps to encode outliers, or low-correlation frames (page 501, section IV). ***Eriksson*** additionally discloses that for

predictive coding either an MA or AR filter can be used, each with specific advantages and disadvantages (page 497, column 2 first paragraph).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have the non-memory Trellis coded quantization unit comprise a third predictor generating a third prediction value by AR filtering obtained from multiplication of the prediction factor of i-th element value by the intra-frame prediction error vector of (i-1)-th element value quantized by the BC-TCQ algorithm and then intra-frame prediction compensated in ***Eriksson***, since it would enable the system to take advantage of both inter-frame and intra-frame redundancy and improving coding efficiency, while simultaneously improving the encoding of outliners, thus minimizing the number of high distortion frames, as indicted in ***Eriksson*** (page 501, section IV).

Eriksson also does not disclose a fourth subtracter obtaining the prediction error vector of i-th element value by subtracting the third prediction value provided by the third predictor from the LSF coefficient vector of i-th element value of the LSF coefficient vector, in which the DC component is removed, provided by the first subtracter, and a second prediction compensation unit performing intra-frame prediction compensation for the quantized prediction error vector of i-th element value, by adding the third prediction value of the third predictor to the quantized prediction error vector of i-th element value provided by the second BC-TCQ. However, in any predictive vector quantizer a prediction error vector is obtained by subtracting a prediction value from the input coefficient vector, while the prediction value is added to the quantized prediction error (***Eriksson*** page 496, Figure 1, encoder).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to determine a third prediction error and perform intra-frame compensation in ***Eriksson***, since one of ordinary skill has good reason to pursue the options within his or her technical grasp in order to obtain the predictable result of an efficient and robust encoder.

Eriksson also does not disclose a second BC-TCQ obtaining the quantized prediction error vector of i-th element value by quantizing the prediction error vector of i-th element value provided by the fourth subtracter according to the BC-TCQ algorithm. However, ***Eriksson*** does disclose that a number of memory-based quantization schemes can be used for LSF parameter quantization, predictive schemes being the most popular (page 495, last paragraph). Additionally, in the same field of endeavor, ***Nikneshan*** discloses the use of a BC-TCQ algorithm for quantizing LSF parameters (page 9-10, section 3, *a tail biting structure is used in a trellis coded quantization scheme, where the start and end state of the trellis paths are the same).*

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the BC-TCQ algorithm for the quantization algorithm in ***Eriksson***, since it avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

As per claim 11, this claim recites limitations similar to those recited in claim 11, and is therefore rejected for similar reasons.

As per claim 12, this claim recites limitations similar to those recited in claim 3, and is therefore rejected for similar reasons.

As per claim 13, this claim recites limitations similar to those recited in claim 3, and is therefore rejected for similar reasons.

As per claim 14, this claim recites limitations similar to those recited in claim 6, and is therefore rejected for similar reasons.

As per claim 15, this claim recites limitations similar to those recited in claim 7, and is therefore rejected for similar reasons.

As per claim 18, this claim recites limitations similar to those recited in claim 2, and is therefore rejected for similar reasons.

As per claim 19, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose the recording medium of claim 18, wherein the medium is one of a magnetic storage medium, an optical readable medium and a carrier wave (section V, *the system is run on a computer, therefore it must be run on either a magnetic storage medium or and optical readable medium*).

As per claim 20, this claim recites limitations similar to those recited in claim 2, and is therefore rejected for similar reasons.

As per claim 21, ***Eriksson*** in view of ***Erzin*** further in view of ***Nikneshan*** disclose method of claim 20, and ***Nikneshan*** further discloses wherein when data analyzed in units of frames is transmitted using the Trellis coded quantization (TCQ) algorithm additional transmission bits for initial states are not needed, reducing computational complexity (page 9-10, section 3).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the structured disclosed in ***Nikneshan*** in ***Eriksson***, since it avoids the need to send extra bits for starting and end states, as indicated in ***Nikneshan*** (page 9, section 3), and therefore improves transmission efficiency while maintaining high speech quality.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see the PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dorothy Sarah Siedler whose telephone number is 571-270-1067. The examiner can normally be reached on Mon-Thur 9:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSS

/Richemond Dorvil/

Supervisory Patent Examiner, Art Unit 2626